Craighead Environmental Research Institute

Monthly Progress Reports

for the Montana Department of Transportation
and Western Transportation Institute

Bozeman Pass Wildlife Monitoring
MSU banner number 425539

1 January – 31 May 2007

This is a report on the Bozeman Pass Post-Fencing Wildlife Monitoring subcontract: MSU banner number 425539. This is a continuation of Task C of the Bozeman Pass Wildlife Channelization ITS Project which was extended with a subcontract addendum, extension and (the first of two) post-fencing monitoring work scope(s) for CERI to continue their wildlife monitoring field data collection efforts. This addendum covers a limited work scope for one (of two related) contract(s) between WTI and MDT (MSU banner number 425539). It was anticipated that the funds in this account/contract would support CERI in their work through approximately May 2007. Once this subcontract is completed, a subsequent, future subcontract associated with the second, related contract (MSU banner number 426899) between MDT and WTI will be established for CERI to complete monitoring and evaluation efforts. Ultimately, data produced from both contracts/subcontracts will be merged and analyzed to address the research questions related to wildlife-vehicle collisions and wildlife movements under I-90.

This report was prepared by staff at the Craighead Environmental Research Institute (CERI) for the Montana Department of Transportation and Western Transportation Institute as part of the Bozeman Pass Wildlife Channelization ITS Project. Reports were planned to be completed on a monthly basis, but since the Wildlife Fencing had not been completed, and the track bed and cameras could not be installed, it was decided to consolidate the first 5 months of 2007 into a single report for Subcontract MSU banner number 425539.

The objective of Task C (MSU Office of Sponsored Programs subcontract GC200-03-Z3137) is to collect, manage, and analyze field data on wildlife traffic victims and wildlife movements on and near I-90 on Bozeman Pass in order to evaluate the effectiveness of wildlife mitigation techniques applied in this area. The Craighead Environmental Research Institute (CERI) oversees the wildlife monitoring aspects of this project. This task includes oversight of :

- Road-kill data collection and data management;
- MRL overpass monitoring including
  - Behavioral observation sessions of animal-road crossing events
  - Collecting tracking event data from track bed/plate(s)

- Maintaining remote motion/heat-triggered still film cameras at existing culverts
- Supervise field technicians with data collection protocols and quality control;
- Data analysis of road-kill and behavioral crossing data;
- Develop GIS maps and analyses;
- Prepare quarterly and annual reports and publications.

This project was planned to continue for one year following the MRL bridge re-build in 2005. Changes in construction schedules extended construction of the bridge re-build into 2006. Completion of the Westbound lane MRL bridge was scheduled for completion in October 2006 but was not completed until early December. The Wildlife Fencing was planned for completion by November 2006 but it was delayed for a number of reasons and little progress had been made by the time of this report in January 2007.

The work scope (referred to as the "January 2007 work scope" to distinguish from the "November 2006 addendum") outlines additional tasks and equipment purchases above and beyond the $4,000 allocated in the November 2006 addendum. Each task described in the three-year plan in the previous chapter is pared down below to reflect the expectations for this work scope. Briefly, CERI was planned to accomplish the following between January and June 2007:

1. Complete sand track bed construction as agreed in the November 2006 addendum (because this serves as an extension to complete tasks agreed to in the November 2006 addendum, the $4,000 budget for those efforts is not included in the January 2007 work scope).
2. Road kill surveys January through April 2007.
3. Camera and counter monitoring at fence ends, jump outs and culverts, with associated equipment purchases through April 2007.
4. Winter tracking as conditions allow.
5. Track bed monitoring at MRL underpass and on jump outs from the time beds thaw (~April) through April 2007.

Task 1: Road Kill Surveys January through May 2007

Road kill surveys were conducted between Bozeman and Jackson Creek Surveys were conducted on both sides of I-90 from Bozeman to Jackson Creek and back for a total of 22 miles round trip and an estimated 1 hour of labor per survey.

CERI personnel recorded road-kill on a three-times-weekly basis. Roadkill data for 2005 and 2006 were reviewed and error-checked with original field data sheets during the last quarter of 2006. Documenting animal-vehicle collisions is still in progress and will continue throughout 2007 during the pre-construction phase.

Sixty-three (63) road-kill surveys were driven during the first 5 months of 2007 between 1 January and 1 June. Twenty-three (23) of those recorded no new road-kill. At 22 miles per survey this equals 1386 miles driven for this project. Previously data had been collected for a 50 mile stretch (both lanes of Interstate 90 for 25 miles each way between Bozeman and Livingston. This survey effort was reduced to 22 miles for the monitoring subcontract but CERI has continued to survey the entire highway segment and is supplementing the survey budget with funding from other sources. Totals of animals killed by species were:

Jan.- June Bozeman Pass Roadkill Totals

Species	Number
Deer species	17
White Tail Deer	13
Mule Deer	2
Skunk	15
Raccoon	7
Rabbit	8
Porcupine	0
Coyote	5
Great Horned Owl	1
Ground Squirrel	2
Badger	0
Dog	0
Elk	1
Red Fox	0
Beaver	1
Black Bear	0
Marmot	2
Small mammal spp.	3
Domestic cat	4
Magpie	4
Grouse	1
Meadowlark	1
Weasel	1

In addition CERI field tested the hand-held PDA/GPS device and WTI's Roadkill Observation Collection System (ROCS) software to record road kill observations and provide feedback to WTI regarding the operation of the system hardware and software.

Task 2: Track bed monitoring at the MRL Bridge through April 2007

Sand track beds at MRL bridge were to be monitored for wildlife tracks as an index of movements under the interstate every other week from the time the track beds have thawed and can accept tracks of passing animals (i.e., ~April) through April 2007 for a total of 3 sampling sessions for this work scope/subcontract. Each sampling session will include visiting the track beds 5 days in a row (i.e., rake on day 0, record tracks on day 1, day 2, day 3 and day 4) for a total of 15 track bed site visits through May 2007. Mileage expenses are included for days when no road kill surveys are scheduled (e.g., Tuesdays and Thursdays of sampling weeks).

However, delays in construction of the fencing, and thus the track bed, have postponed the start of this task. Construction for the MRL bridge re-build began on April 4, 2006. An access road was constructed across the railroad and track bed on April 15. The westbound lane of the existing bridge was removed on April 18 and the eastbound lane of the bridge was completed in December 2006. Construction necessitated using the

track bed location as a staging area for materials and equipment. Consequently monitoring of the track bed was suspended through most of 2006. Completion of the track bed is anticipated in June 2007 at which time track bed surveys will continue.

Wildlife track data was collected for over one year prior to that time. The track bed was monitored on average about every other day; tracks were recorded and the surface was raked clean. Daily visits were done during inclement weather since rain and wind can obscure some tracks if left too long. Deer have been the main users of the underpass. Deer use has been summarized by number of crossings per day whenever possible. This metric will allow comparisons to be made between seasons and to compare rates of crossing before the fencing and bridge re-build with rates after construction.

Task 3: Photo monitoring at fence ends through April 2007

Photo monitoring will be used to quantify numbers and species of animals moving around the ends of the wildlife fencing to cross I-90 at grade. A total of 4 remote-trigger IR flash (invisible to passing drivers) digital cameras will be placed at the 4 termini of the wildlife fencing. Monitoring will occur year-round. Camera setup (including equipment purchases and theft-proofing) is anticipated to take 5 hours. Data downloading will occur in conjunction with MRL track bed visits but do not have to be checked as frequently as the track beds are checked. For the January 2007 work scope, CERI planned to visit the cameras to download data a total of 5 visits through April 2007. However, as of June 1, 2007, the fencing installation has been delayed and may not be complete until mid-June 2007; therefore, as task 3 is delayed to accommodate the late fencing installation, there will be fewer than 5 visits to download data from the cameras under this subcontract. However, given that there is no labor budgeted for camera installation and field testing, WTI and CERI decided that CERI can use the windfall of these "extra" visits to fine-tune the equipment once the fencing is installed and the cameras can be mounted on the fence ends. WTI has provided CERI with 4 Reconyx digital IR flash cameras with battery holders at no cost for CERI's use throughout the three-year monitoring effort. Additional budget has been included in this task for CERI to purchase additional necessary accessories as outlined below. WTI and CERI have coordinated to "theft-proof" the equipment before it is installed in the field.

Task 4: Infrared counter monitoring at jump outs through April 2007

Infrared counters will be used to quantify numbers of animals moving over the jump outs. A total of 4 infrared counters will be placed at jump outs to monitor wildlife movements; setup (including equipment purchases and theft-proofing) is anticipated to take 5 hours and data downloading is expected to require a total of 5 visits and 1.5 hours per visit through April 2007. As of June 1, 2007, jumpout installation has been delayed and may not be complete until mid-June 2007; therefore, as task 4 is delayed to accommodate the late fencing installation, there will be fewer than 5 visits to download data from the counters. However, given that there is no labor budgeted for counter installation and field testing, WTI and CERI decided that CERI can use the windfall of these "extra" visits to fine-tune the equipment once the fencing is installed and the counters can be installed on the jumpouts. WTI will provide CERI with infrared counters

at no cost for CERI's use throughout the three-year monitoring effort. Additional budget has been included in this task for CERI to purchase additional necessary accessories as outlined below. WTI and CERI have coordinated to "theft-proof" the equipment before it is installed in the field

Task 5: Track bed monitoring at fence ends, jumpouts through April 2007

Track beds will be used to verify data collected on remote cameras and counters in case those systems fail or prove unreliable. Species identification from track beds will complement counter data at jump-outs. A total of 8 sand track beds (4 on top of and 4 at the bottom or exit of the 4 jump outs), were planned to be monitored on the same schedule as the track bed at the MRL bridge (see task 2); i.e., from the time the track beds have thawed and can accept tracks of passing animals (i.e., ~April) through April 2007 for a total of 3 sampling sessions. Each sampling session will include visiting the track beds 5 days in a row (i.e., rake on day 0, record tracks on day 1, day 2, day 3 and day 4) for a total of 15 track bed site visits through May 2007. Mileage expenses are covered in task 2. However, delays in construction of the fencing, and thus the jump-outs and fence-end track beds, have postponed the start of this task through the first five months of 2007. Completion of the fencing is anticipated in June 2007 at which time jump-out and fence-end monitoring will begin.

Task 6: Photo monitoring of culverts January through April 2007

To reconcile the total movements around at the eastern end of the wildlife fence, cameras can determine if animals have been directed through culverts rather than around fence ends (this is not proposed at the west end of the fence, because there are no below-grade passage opportunities in that area). Two infrared remote-trigger cameras will be used in the double culverts in that area; these below-grade culvert movement data will be combined with data from at-grade fence end-runs to assess total movement in that area. Setup (including equipment purchases and theft-proofing) was anticipated to take 5 hours and data downloading is expected to require 5 visits, with each visit taking approximately 1.5 hours to maintain the camera equipment and download data through April 2007. However, delays in construction of the fencing have postponed the start of this task through the first five months of 2007. Completion of the fencing is anticipated in June 2007 at which time photo monitoring of culverts will begin.

Task 7: Opportunistic Snow Tracking January through April 2007:

Track beds at the MRL bridge, fence ends, and jump-outs are often ineffective during winter months when the surface freezes. Opportunistic snow surveys would provide data on movements during winter months that are comparable with MRL track bed data from the pre-construction period. When snow conditions allow, animal tracks will be monitored under the MRL bridge, at jump outs and ends of fences up to 15 times per year. These data will complement the other movement data (e.g., gathered using track beds, counters, remote-cameras) and provide additional evidence of how animals move in

relation to the fencing and fence ends as well as the MRL bridge, and other below-grade passage opportunities. Because the duration of this subcontract occurs during the majority of the winter weather from January through March, a total of 10 visits will be allowed on this work scope (leaving up to 5 snow tracking visits for the late winter months of 2007). Ten hours of opportunistic snow tracking were completed from Nov. 1, 2006 to Jan. 31, 2007. Snow conditions did not allow tracking after Jan 31.

Task 8: Data Management & Reporting January through May 2007

Data is entered, cleaned and archived by CERI. Data is managed in a manner that will allow for CERI and WTI to analyze and report final results as a team (e.g., keys for spreadsheet headers and other relevant notes will be included in data files).
CERI will send brief monthly reports with associated monthly invoices to WTI describing their efforts for that month including a summary of the data collected, equipment purchases or malfunctions (including any thefts of equipment) and any anticipated absences or difficulties with accomplishing tasks. Labor for this task was estimated to require two hours a month through May 2007. As reported above the first five monthly reports were consolidated into a single report because of delays in construction and inability to begin monitoring activities. However, data entry and summary still required two hours per month.

Discussion

This project has experienced unavoidable delays due to the inability of the wildlife fencing contractor to complete the fencing on time. Fencing was scheduled to be completed in November, 2006. The fencing segment west of the MRL bridge was completed about 15 May, 2007. The fencing segment east of the MRL bridge is still under construction at the time of this report: 31 May, 2007. Because of these delays, and the fact that fence materials are stored in the area of the track bed, and because equipment traffic continues to traverse the track bed site, we have been unable to complete construction of the track bed or the jump-out track beds, or to install the remote sensor cameras and counters at the jump-outs or fence ends.

These delays have also postponed data collection for about 6 months. Since the project was originally designed for a full 3 years of data collection this will necessitate extending the contract period for about 6 months until the fall of 2010 in order to collect a statistically significant sample of monitoring data.